Aerial IR Camera Project Proposal for Uinta Basin

BLM/UDAQ/EPA

Project Objectives

1. Carry out an aerial infrared camera-based survey of leaks from a large percentage of the oil and gas facilities in the Uinta Basin.

2. Engage oil and gas well operators to inspect facilities where leaks are discovered, repair leaks, and report information about repairs.

3. Analyze the collected data.

4. Evaluate the effectiveness and cost-effectiveness of aerial leak surveys and the utility of implementing a routine aerial leak detection and repair program for the Uinta Basin.

General Approach

- Contract Leak Surveys Inc. (LSI)
- Conduct a 3-week ~~series of~~ aerial infrared (IR) survey~~s~~ via helicopter
- Count facilities flown over
- Log data of observed emissions
- Analyze data and videos, differentiate routine/allowable vs. malfunction, and rank based on severity of emissions
- Contact operators with log of observed emissions and IR video(s)
- Allow operators to respond, determine cause, fix, and report cause and repair

NEPA – How Aerial IR Survey could fit

- Component of the BLM's Basin-wide Ozone Action Plan outlined in previous NEPA documents
- Component of the "enhanced mitigation" required in Adaptive Management Strategy triggered by ozone exceedances in 5 already-approved EISs/EAs
- As a component of ozone mitigation in the new NEPA actions under review
- Operators reduce emissions from existing sources through a "Find & Fix" approach and share lessons learned on root causes of super-emitters
- Informs emission inventory work – currently no accounting for super-emitters in Uinta Basin emission inventory
- Learn about root causes of super-emitters to prevent in future through maintenance practices

Benefits to project participants

- Discrete, cost-effective project
- Detection costs borne by government agencies
- Supports NEPA mitigation commitments to avoid adverse ozone impacts in NEPA projects currently awaiting approval to show reductions in existing emissions
- "Find & Fix" versus enforcement (*fix before winter ozone season*)
- Inform emission inventory work for more complete emission inventory which will inform cost-effective emission mitigation options for SIP
- Learn about root causes of super-emitters to prevent in future through maintenance practices
- Conserve gas → more to market

Cost & Schedule

- Occur in 2016 before winter and potential reservation-specific FIP or BLM Waste Prevention (F&V) regs

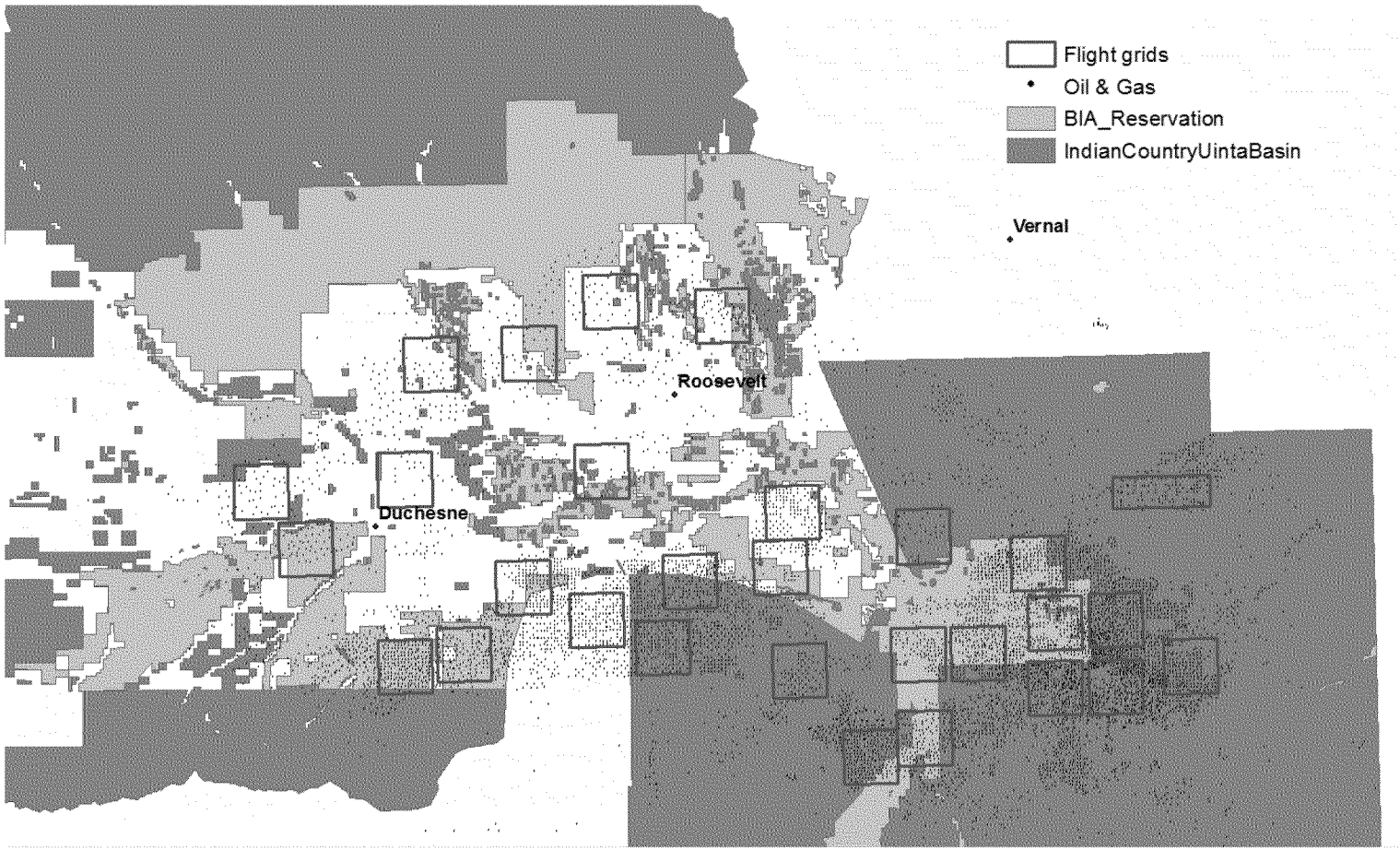
- Fly-over with IR camera survey
  - 15 days, 29 "grids", **$105k**
  - Cover ~4800 sites (~44% of oil & gas wells)
  - Representative by Operator, age, production volume, well type (incl. abandoned)
  - Cover >50% of compressor stations and gas plants

- Ground-based IR camera survey
  - 24 days, 1 "grid", $26k
  - Cover ~165 sites
  - For same coverage as fly-over: ~700 days, **$760k**

Grid Development

- "Grids" are sections of land designated to be flown over
- 29 grids created - 15 square miles each
- 2 grids per day
- Distance from airports
  - 35 miles maximum
  - Roosevelt Municipal Airport
  - Vernal Regional Airport
- 4,791 active, producing wells in grids (avg. 165 wells/grid) … ~44% of universe

Grid Pattern



Contractor

- Leak Surveys Inc. (LSI)
  - Based in TX
  - Have conducted dozens of flyover campaigns for TCEQ, EPA Region 6 & 4, Industry, and researchers in many different basins

http://www.leaksurveysinc.com

Precedence of Aerial IR Surveys in O&G

- TCEQ - 16 campaigns since 2005
  - $200,000 for a 2 month campaign
  - $50,000-$75,000 for that smaller, earlier campaigns
- R6 - 5 campaigns in 2012-2013
- Both agencies concluded about 10% of facilities had continuous leaks, unintentional gas carry through, or unpermitted releases
- EDF Aerial IR Surveys of 7 basins
  - Ranged from 1% - 14% of facilities with observable emissions from air
  - 6.6% of sites in UB (1389 wellpads surveyed)
- LSI contractor - has conducted dozens of flyover campaigns for TCEQ, EPA Regions 6 & 4, Industry and researchers (EDF study) in many different basins across the U.S.

Survey Protocol

- Only LSI employees will be allowed in helicopter
  - Weight constraints
- Keep a count of number of facilities flown over
- At an observed hydrocarbon release:
  - Circle the emission source and facility 360°
  - Record IR video of releases for ≥ 90 seconds to differentiate intermittent (e.g. flash emissions from dump event) from unintentional gas carry-through. At random observations (e.g. 5th in each grid) record for ~5 minutes.
  - Take digital photos – overall facility and emission source
  - Record all required data for log
- In the event of an emergency emission the helicopter is to land and report it to BLM immediately